Ruggcore™ REC5425

User Manual

Ruggdized Embedded Controller

Intel Core™2 Duo (Merom) / Intel Celeron™ M (Yonah) Processor

(2nd Edition 03/03/2009)

All information is subject to change without notice.

Approved by	Checked by	Prepared by
Ming	Hank	Jack

RECORD OF REVISION

Version and Date	Page	Old Description	New Description	Remark
Jan.20 2009	all		Preliminary Release	
Mar.03 2009	all		Adding Product SKU & ordering information	

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Packing List

Before installation, please ensure the following items have been shipped:

- 1 x REC5425 Embedded Controller
- 2 x Wallmount Brackets
- 1 x Screw Package (M3 x 16mm)
- 1 x DVI-I to VGA Port Connector
- 1 x HDD Bay Upgrade Kit (1x Bracket, 4x Screw, 4x Damper, 1x SATA Signal cable, 1x SATA Power cable)
- 1 x CD-ROM for manual (in PDF format) and drivers

If any of these items should be missing or damaged, please contact your distributor or sales representative immediately.

Ordering Information

Model Number Description

REC5425-A01
Intel Celeron M 1.86GHz (440), 1GB RAM, Fanless, DC9~36V input, LANx1, Giga LANx1, USBx4, COMx6, DVI-Ix1, HDMIx1 (option), LVDSx1, CF Slot, HDD Bayx1, PCI Slotx1, DI/DOx4

REC5425-A01-01
Intel Celeron M 1.86GHz (440), 1GB RAM, Fanless, DC9~36V input, LANx1, Giga LANx1, USBx4, COMx6, DVI-Ix1, HDMIx1 (option), LVDSx1, CF Slot, 80GB HDD with XPe pre-installation, PCI Slotx1, DI/DOx4

REC5425-A02
Intel Core2Duo 2.16GHz (T7400), 1GB RAM, Fanless, DC9~36V input, LANx1, Giga LANx1, USBx4, COMx6, DVI-Ix1, HDMIx1 (option), LVDSx1, CF Slot, HDD Bayx1, PCI Slotx1, DI/DOx4

REC5425-A02-01
Intel Core2Duo 2.16GHz (T7400), 1GB RAM, Fanless, DC9~36V input, LANx1, Giga LANx1, USBx4, COMx6, DVI-Ix1, HDMIx1 (option), LVDSx1, CF Slot, 80GB HDD with XPe pre-installation, PCI Slotx1, DI/DOx4

REC5425-A03
Intel Core2Duo 1.66GHz (T5500), 1GB RAM, Fanless, DC9~36V input, LANx1, Giga LANx1, USBx4, COMx6, DVI-Ix1, HDMIx1 (option), LVDSx1, CF Slot, HDD Bayx1, PCI Slotx1, DI/DOx4

REC5425-A03-01
Intel Core2Duo 1.66GHz (T5500), 1GB RAM, Fanless, DC9~36V input, LANx1, Giga LANx1, USBx4, COMx6, DVI-Ix1, HDMIx1 (option), LVDSx1, CF Slot, 80GB HDD with XPe pre-installation, PCI Slotx1, DI/DOx4

REC5425-B01
Barebone, Fanless, DC9~36V input, LANx1, Giga LANx1, USBx4, COMx6, DVI-Ix1, HDMIx1 (option), LVDSx1, CF Slot, HDD Bayx1, PCI Slotx1, DI/DOx4

Optional Accessories

840612073000 AC-to-DC Adapter DC12V/7.0A 84W (max), with Phoenix Power Plug
476000001001 Din-rail Bracket
810501201000 PS/2 Y Cable for Keyboard and Mouse
810218001020 DVI-I to DVI-D & DVI-I to VGA Port Y Cable
800105005010 LVDS Cable, for CM1236 & CM1555 panel, 500mm
800105005020 LVDS Cable, for AU1744 & AU1954 panel, 500mm
810518001030 HDMI cable
810618301015 Power Cable USA Type
810618301070 Power Cable Europe Type

Safety & Warranty

1. Read these safety instructions carefully.
2. Keep this user's manual for later reference.
3. Disconnect this equipment from any AC outlet before cleaning. Do not use liquid or spray detergents for cleaning. Use a damp cloth.
4. For pluggable equipment, the power outlet must be installed near the equipment and must be easily accessible.
5. Keep this equipment away from humidity.
6. Put this equipment on a firm surface during installation. Dropping it or letting it fall could cause damage.
7. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
8. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
9. All cautions and warnings on the equipment should be noted.
10. If the equipment is not used for a long time, disconnect it from the power source to avoid damage by transient over-voltage.
11. Never pour any liquid into an opening. This could cause fire or electrical shock.
12. Never open the equipment. For safety reasons, only qualified service personnel should open the equipment.
13. If any of the following situations arises, get the equipment checked by service personnel:
    a. The power cord or plug is damaged.
    b. Liquid has penetrated into the equipment.
    c. The equipment has been exposed to moisture.
    d. The equipment does not work well, or you cannot get it to work according to the user's manual.
    e. The equipment has been dropped and damaged.
    f. The equipment has obvious signs of breakage.
14. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT WHERE THE STORAGE TEMPERATURE IS BELOW -20°C (-4°F) OR ABOVE 70°C (158°F). IT MAY DAMAGE THE EQUIPMENT.

FCC Safety

This device complies with Part 15 FCC Rules.
Operation is subject to the following two conditions:
(1) this device may not cause harmful interference, and
(2) this device must accept any interference received including interference that may cause undesired operation.

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1.0 INTRODUCTION

1.1 About Ruggcore™ Embedded Controller

The REC5425 Embedded Controller system's design concept not only focuses on the fast expanding Machine Automation market but also the Industrial Automation industry. The REC5425 can provide one mini PCI-E slot (internal) and one mini PCI slot (internal) for expansion.

A solid sealed aluminum case provides vibration and dust resistance while also providing a passive cooling solution. The REC5425 provides system integrators with a turn-key solution and versatile application development path to fulfill the diversified market demand.

The REC5425 can be used as a standalone system, wall-mounted, DIN-rail mounted. The system accepts a wide range of power supplies (DC power in) and comes in a footprint of only 262(W) x 86(H) x 184 (D) mm. The rugged aluminum case not only provides great protection from EMI, shock/vibration, cold and heat, but also passive cooling for quiet fanless operation.

The REC5425 equips the rich I/O by offering 1 x DVI-I (or 1 x HDMI) and 1 x LVDS interface for dual display, 4 x USB 2.0 ports,1 x Giga LAN port, 1 x 10/100 LAN port and 6 x COM ports; packed into a small rugged unit and powered by an Intel Core2 Duo/ Core Duo/ Core Solo/ Celeron M processor. It also supports a wide range of input voltages from 9V DC to 36V DC. The REC5425 Embedded Computer supports Compact Flash card for storage options and it can provide the diversified application field.

Therefore REC5425's expandable function, compact size combined with fanless design and highly efficient heat conduction mechanism can fulfill any rugged technical application in industrial automation, factory control, test instrumentation and safety surveillance.

1.2 FEATURES

- Intel® Core™2 Duo/ Core Duo/ Core Solo/ Celeron M Based Fanless Design
- Rich IO (4 USB, 6 COM, 2 Ethernet)
- Rich Video [LVDS, DVI-I or HDMI (option)]
- Stackable Chassis Upgrade Design with Easy Expansion Solution Kit

1.3 SPECIFICATIONS:

System

Processor	*Intel Core 2 Duo (Merom), Core Duo, Core Solo/ Celeron M (Yonah)*
Chip Set	*Intel945GME + ICH-7M*
System Memory	*DDRII SODIMM x 1, Max. 2GB (DDRII 400/533/667)*
Ethernet	*Intel EP82562ET, 10/100 Base-TX* *Intel 82573 GbE (Gigabit Ethernet)*
Storage	*CF Card & HDD Bay*
Audio	*ALC655, Line-Out, MIC*

I/O Interface-Front	*PWR/HDD LED, DC-In, Power on SW, KB/MS* *RJ45 x2, USB x4, COMx6 (RS232 x5, RS232/422/485 x1)*
I/O Interface-Rear	*Audio Phone Jack (Line-out, MIC-in)* *DVI-I or HDMI* (option),*LVDS Connector, CF Connector*
BIOS	*Award*
Wake On LAN	*YES*
Watchdog Timer	*Generates a time-out system reset*
H/W Status Monitor	*Supports power supply voltages, fan speed and temperature monitoring*
Expansion Interface	*Mini PCI (internal)* *Mini PCI-E (internal)* *PCI Slot (external)*
Power Supply	*1. DC Input:* *Input voltage: 9V DC ~ 36V DC*

Mechanical

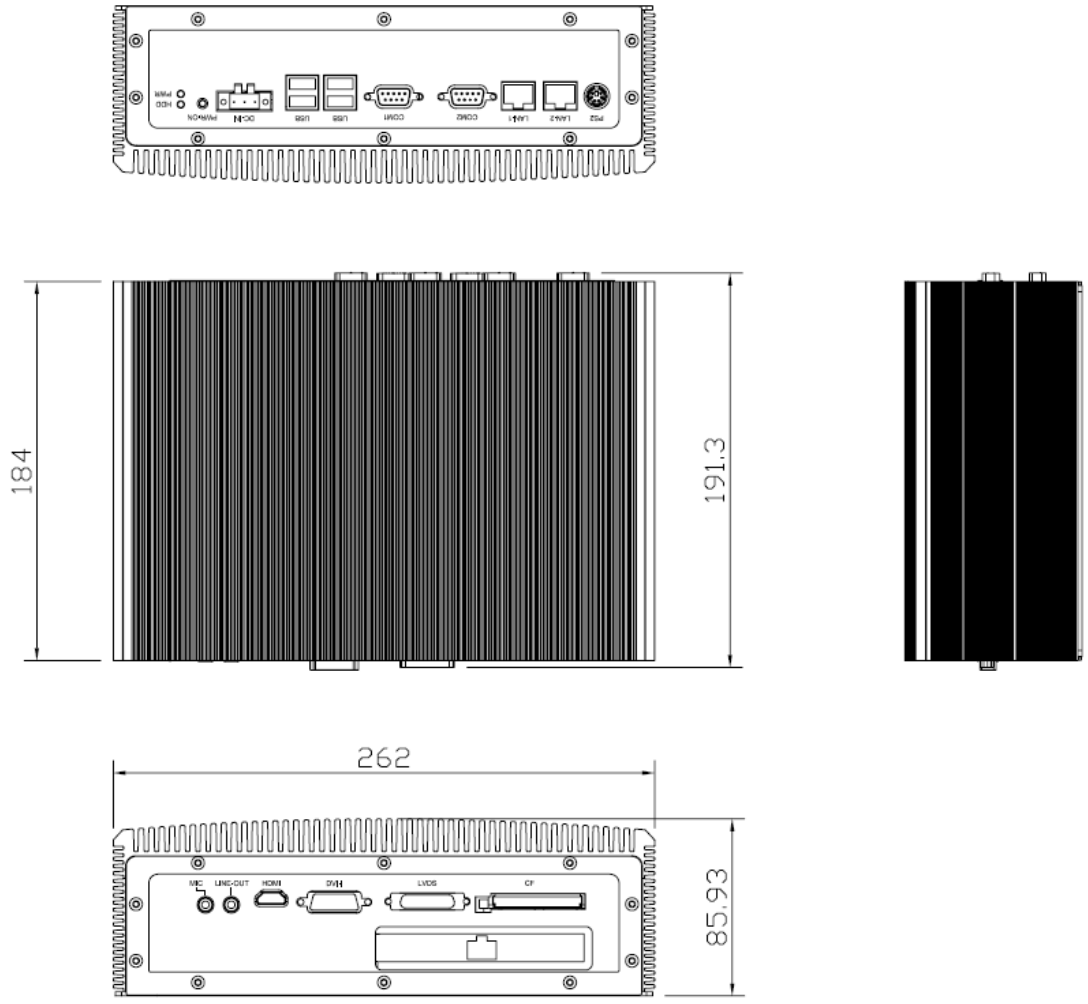
Construction	*Rugged Aluminum Alloy chassis*
Mounting	*Wallmount, Desktop, DIN Rail*
Dimension	*262mm (W) x 86mm(H) x 184mm(D)*
Net Weight	*4.6Kg*

Environment

Operating Temperature	*-15°C ~ 55°C (5°F ~ 131°F) - CFD*
Storage Temperature	*-20°C ~ 70°C (-4°F ~-158°F)*
Operating Humidity	*5~90% @ 40°C, non-condensing*
Vibration:	*5g rms / 5~500Hz / random operation (CFD);* *1g rms / 5~500Hz / random operation (HDD);*
Shock:	*50g peak acceleration (11msec. duration)(CFD)* *20g peak acceleration (11msec. duration) (HDD)*
Certification	*CE/FCC class A*

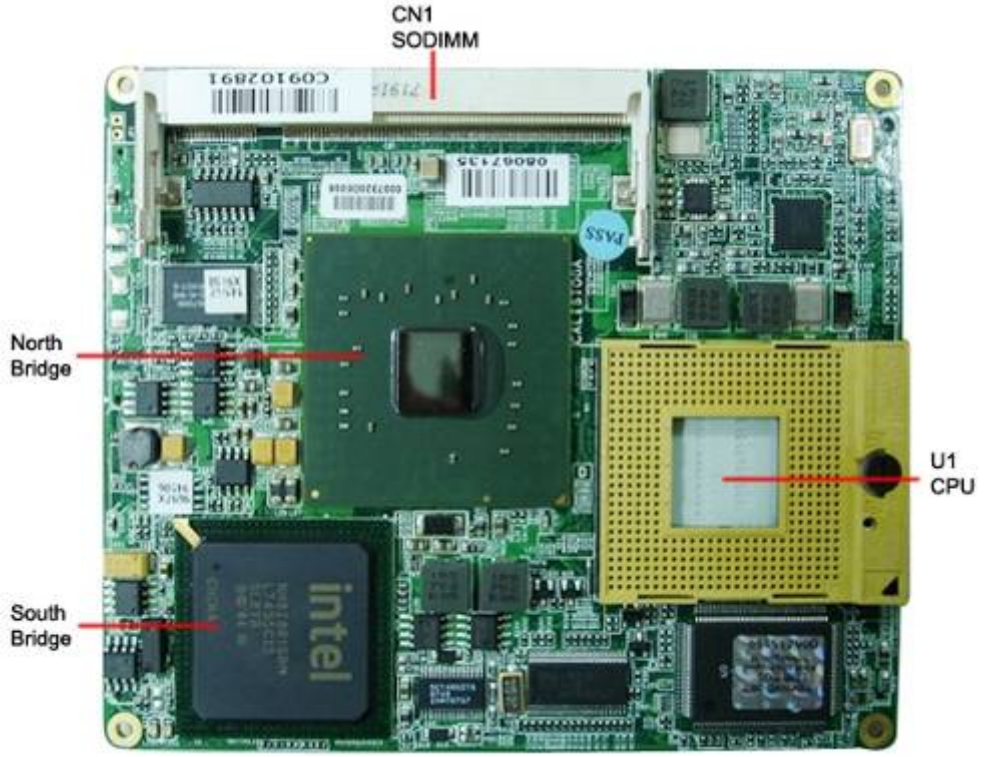
2.0 HARDWARE INSTALLATION

2.1 REC5425 Dimension

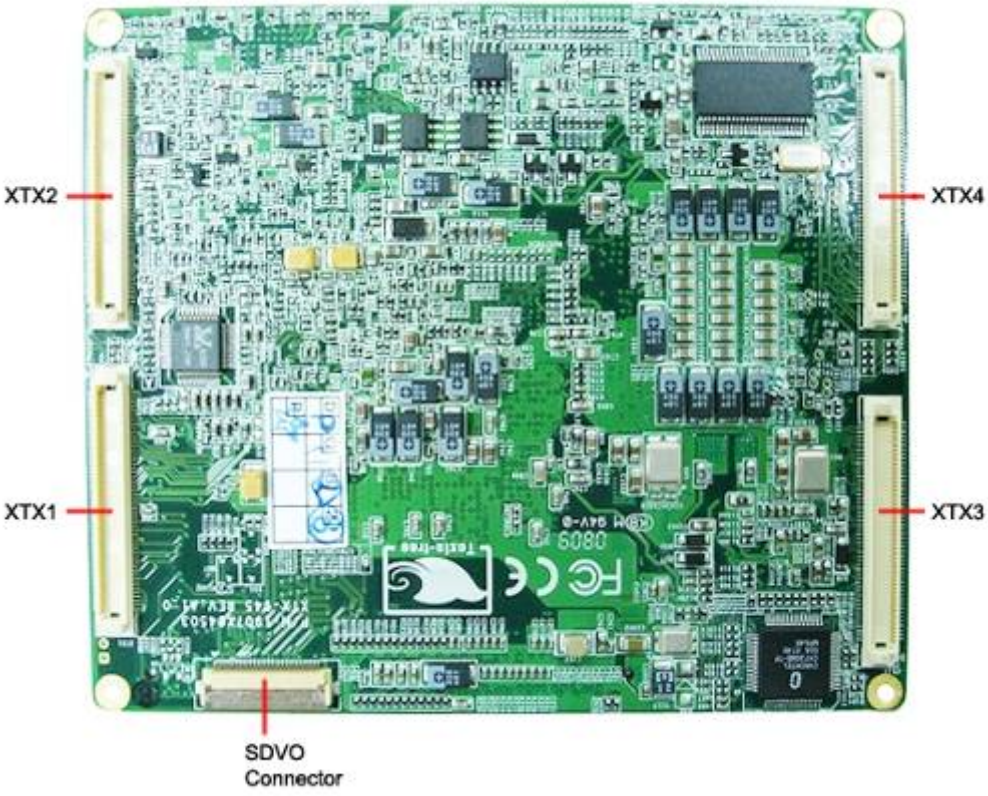


2.2 CPU Board Mechanical Drawing

Component Side



Solder Side



2.2.1 List of Connectors

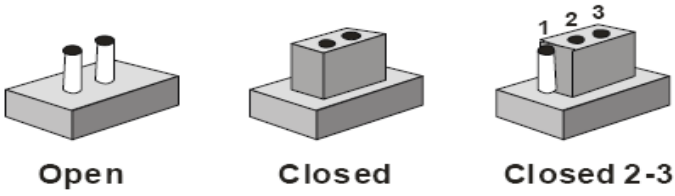
The CPU board has a number of connectors that allow you to configure your system to suit your application.
The table below shows the function of the board's connectors:

Connectors

Label	Function
U1	CPU socket
CN1	DDR2 SODIMM slot
CN2	SDVO connector
XTX1	XTX connector (PCI Bus/4xUSB 2.0/Audio)
XTX2	XTX connector (4xPCI-E/2xUSB 2.0/2xSATA/HDA/LPC/Fan)
XTX3	XTX connector (VGA/LVDS/TV-out/COM1&2/PS-2 KB&MS/IR/Parallel Port)
XTX4	XTX connector (IDE/Ethernet/SMBus/I2C)

2.2.2 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip.
To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.

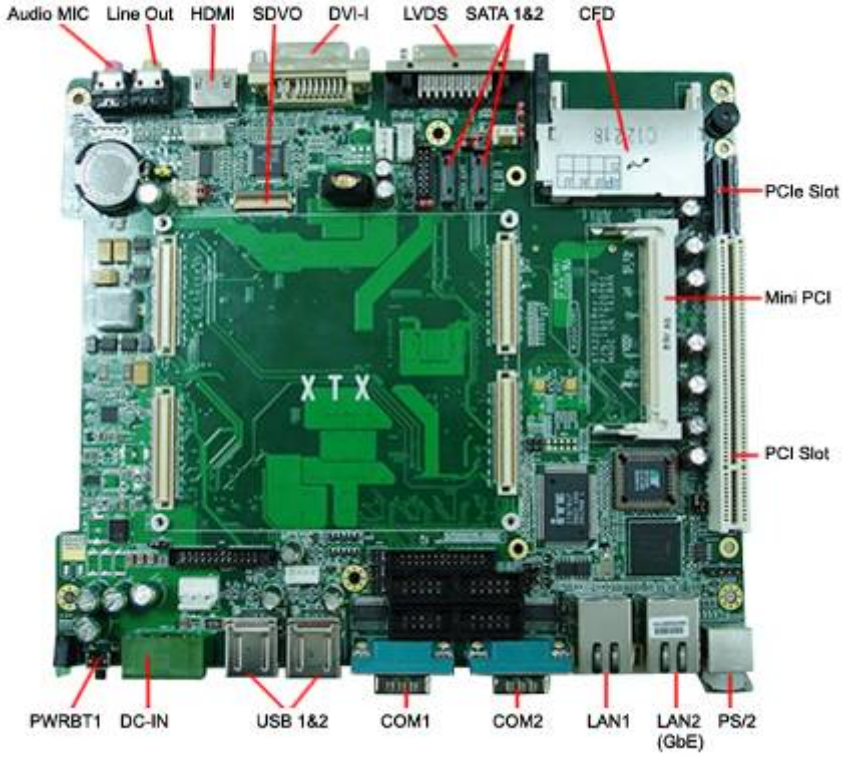


A pair of needle-nose pliers may be helpful when working with jumpers.
If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change. Generally, you simply need a standard cable to make most connections.

2.3 Carrier Board Mechanical Drawing

Jumpers and Connectors Location in Carrier Board

Component Side



Solder Side

2.3.1 List of Connectors

Location	Function
DC1	DC Power Input Connector
CN6	LPC and Digital I/O Connector.
CN7	HDMI Connector
CN8	SDVO Connector
CN9	USB Connector
CN10	XTX Connector
CN11	LVDS Connector
CN12	I2C Connector
CN14, CN15, CN17, CN18	COM3,4,5,6 Connector
CN16	Front Panel Connector
CN20	Keyboard/Mouse Connector
CN21	IrDA Connector
CN22	Mini Card Connector
DVI-I	DVI + VGA Connector
USB1, USB2	Dual USB Ports
LAN1, LAN2	RJ45 Connector
MPCI1	MINI PCI CONNECTOR
PCI1	PCI Slot
CFD1	Compact Flash Connector
SATA1, 2	SATA Connectors
COM1, COM2	D-sub 9 pin Connector
FAN1,2	FAN Connector
PWR1	HDD POWER Connector
PWRBT1	POWER BUTTON Switch
LPT1	PARALLEL PORT Connector
JP4,JP5,JP10,JP13	COM Port Power +12V/+5V/RING Selection
JP12, JP15, JP16	COM2 RS232/RS422/RS485 Selection
JP11	Compact Flash Voltage Selection
CMOS1	CMOS Clear Selection
JP6	Backlight / LVDS Power Selection

2.4 External I/O Connectors

Front View

Rear View

1. DC-IN: DC Power Input

Pin	Signal
1	+9~36V DC input (V+)
2	Voltage Ground (0V)
3	Cable Shading Ground

Please pay special attention to make sure the plus voltage input in pin1 (V+), zero voltage input in pin2. Mix these two pins may cause product damage. Pin 3 is system shading ground.

2. CN6: LPC and Digital IO Connector.

LPC Connector			
Pin	**Signal**	**Pin**	**Signal**
1	+3.3V	2	LPC_FRAME#
3	LPC_AD0	4	LPC_AD1
5	LPC_AD2	6	LPC_AD3
7	GND	8	LPC_CLK33
9	INT_SERIRQ	10	ICH_DRQ#0
11	GND	12	LPC_RST#
13	PCI_PME#	14	+5V
15	+5VDUAL	16	GND
17	SIOGPIO56	18	SIOGPIO57
19	SIOGPIO60	20	SIOGPIO61
21	SIOGPIO51	22	SIOGPIO52
23	SIOGPIO45	24	SIOGPIO47

3. CN8: SDVO Connector

SDVO Connector			
Pin	**Signal**	**Pin**	**Signal**
1	GND	2	SDVOC_CLK-
3	SDVOC_CLK+	4	GND
5	SDVOC_G-	6	SDVOC_G+
7	GND	8	SDVOC_INT-
9	SDVOC_INT+	10	GND
11	SDVOC_B-	12	SDVOC_B+

13	GND	14	SDVOC_R-
15	SDVOC_R+	16	GND
17	NC	18	NC
19	GND	20	SDVO_CLCLK
21	SDVO_CLDATA	22	SDVO_RST#
23	+3.3V	24	+2.5V
25	+5V	26	GND
27	NC	28	NC
29	NC	30	NC

4. CN9: USB Connector (Internal Pin Header)

Pin	Signal
1	USB Power
2	USBD4-
3	USBD4+
4	GND

5. CN11: LVDS Connector

LVDS Connector			
Pin	**Signal**	**Pin**	**Signal**
1	BLON#	2	L_BKLTCTL
3	LVDS Power	4	GND
5	LA_CLKN	6	LA_CLKP
7	LVDS Power	8	GND
9	LA_DATAN0	10	LA_DATAP0
11	LA_DATAN1	12	LA_DATAP1
13	LA_DATAN2	14	LA_DATAP2
15	LA_DATAN3	16	LA_DATAP3
17	L_DDC_DATA	18	L_DDC_CLK
19	LB_DATAN0	20	LB_DATAP0
21	LB_DATAN1	22	LB_DATAP1
23	LB_DATAN2	24	LB_DATAP2
25	LB_DATAN3	26	LB_DATAP3
27	LVDS Power	28	GND
29	LB_CLKN	30	LB_CLKP

6. CN12: I2C Connector

Pin	Signal
1	+3.3V
2	I2C_CLK
3	I2C_DAT
4	GND

7. CN14: COM3 Connector (Internal)
CN15: COM4 Connector (Internal)
CN17: COM5 Connector (Internal)
CN18: COM6 Connector (Internal)

COM3, COM4, COM5, COM6			
Pin	**Signal**	**Pin**	**Signal**
1	DCD3	2	RXD3
3	TXD3	4	DTR3
5	GND	6	DSR3
7	RTS3	8	CTS3
9	RING3	10	NC

8. JP4: COM3 +12V/+5V/RING Selection
JP13: COM4 +12V/+5V/RING Selection
JP5: COM5 +12V/+5V/RING Selection
JP10: COM6 +12V/+5V/RING Selection

	+12V			
	2	**4**	**6**	
	●	○	○	
	■	○	○	
	1	**3**	**5**	
	+5V			
	2	**4**	**6**	
	○	●	○	
	□	●	○	
	1	**3**	**5**	
	RING (Default)			
	2	**4**	**6**	
	○	○	●	
	□	○	●	
	1	**3**	**5**	

9. COM1, COM2: D-Sub 9 Pin COM Port Connector.

10. JP12, JP15, JP16: COM2 RS232/RS422/RS485 Selection

	Default									
	RS232				RS422				RS485			
JP12	1	2	3		1	2	3		1	2	3	
	●	●	○		●	●	○		○	●	●	
JP15	1	2	3		1	2	3		1	2	3	
	●	●	○		○	●	●		○	●	●	
JP16	1	2	3		1	2	3		1	2	3	
	●	●	○		○	●	●		●	●	○	

11. CN16: Front Panel Connector

Front Panel Connector			
Pin	**Signal**	**Pin**	**Signal**
1	LCD_UP	2	LCD_DW
3	GND	4	PANSWH#
5	POWERLED	6	HDD_LED
7	NC	8	GND
9	SP_UP	10	SP_DW
11	GND	12	HWRST#
13	+5V	14	+3.3V

12. CN21: IrDA Connector

Pin	**Signal**
1	+5V
2	NC
3	IRRX
4	GND
5	IRTX

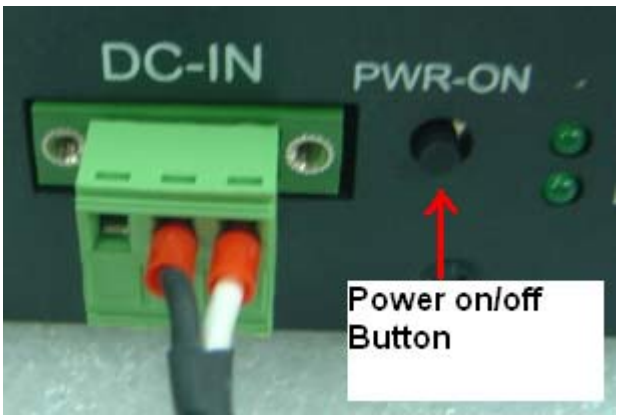
13. FAN1, FAN2: FAN Connector

Pin	**Signal**
1	GND
2	FAN Power
3	FAN_TAC

14. PWR1: SATA HDD Power Connector

Pin	**Signal**
1	+5V
2	GND
3	+12V
4	GND

15. PWRBT1: Power on/off Button



16. LPT1: Parallel Port Connector

PARALLEL PORT			
Pin	**Signal**	**Pin**	**Signal**
1	STB-	2	AFDX
3	PTD0	4	ERRX
5	PTD1	6	PAR_INITX
7	PTD2	8	SLINX
9	PTD3	10	GND
11	PTD4	12	GND
13	PTD5	14	GND
15	PTD6	16	GND
17	PTD7	18	GND
19	ACKX	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	GND

17. JP11: Compact Flash Voltage Selection

	+3.3V Power for Compact Flash			
	1	2	3	
	■	●	○	

	+5V Power for Compact Flash			
	1	2	3	
	□	●	●	Default

18. CMOS1: CMOS Clear Selection

	Clear CMOS			
	1	2	3	
	□	●	●	

	Normal Operation			
	1	2	3	
	■	●	○	Default

19. JP6: Backlight / LVDS Power Selection

	+3.3V Power for Backlight Default				
	2	4	6	8	10
	●	○	○	○	○
	■	○	○	○	○
	1	3	5	7	9

	+5V Power for Backlight				
	2	4	6	8	10
	○	●	○	○	○
	□	●	○	○	○
	1	3	5	7	9

	+3.3V Power for LVDS Default				
	2	4	6	8	10
	○	○	●	○	○
	□	○	●	○	○
	1	3	5	7	9

	+5V Power for LVDS				
	2	4	6	8	10
	○	○	○	●	○
	□	○	○	●	○
	1	3	5	7	9

	+12V Power for LVDS				
	2	4	6	8	10
	○	○	○	○	●
	□	○	○	○	●
	1	3	5	7	9

20. Standard Connectors:

CN10: XTX Connector Raw A,B,C & D
CN7: HDMI Connector
CN20: PSII Key Board/Mouse Connector
CN22: Mini Card Connector (Mini PCI-e + USB)
DVI-I: DVI-I Connector
USB: Dual USB Connector
LAN1: RJ45 Connector
LAN2: RJ45 Connector
MPCI: Mini PCI Connector
PCI1: PCI Slot and PCI-E Slot
CFD1: Compact Flash Connector.
SATA1: SATA Connector
SATA2: SATA Connector

2.5 System Installation

1. Connect the cables into the appropriate connectors as below.

2.1 **Option 1**: **DVI-D or VGA output**
Please choose DVI-I Y cable as your option. Connect the DVI-I Y cable into the DVI connector as below if you use DVI-D or VGA input display. Before you enable DVI output function, you need to setup BIOS. Please refer to (Chapter3 Award BIOS Setup 4) for detail.

2.2 **Option 2: VGA Output**
Please choose DVI-I to VGA converter as your option
Connect the DVI-I to VGA converter into the DVI connector as below if you choose VGA input display as default.

Connect the VGA cable into the DVI-I converter as below.

2.3 **Option 3**: **HDMI Output (option)**
Connect the HDMI cable into the HDMI connector as below if you choose HDMI input high quality display. Before you enable HDMI output function, you need to setup BIOS. Please refer to (Chapter3 Award BIOS Setup 4) for detail.

2.4 **Option 4**: Choose LVDS cable as your option
Connect the LVDS cable into the LVDS connector as below if you choose LVDS input panel. Before you enable LVDS output function, you need to setup BIOS. Please refer to (Chapter3 Award BIOS Setup 4) for detail

3. Compact Flash Card Installation

The Upper Side of CF Card

Please be noted that the user should turn the CF card to the bottom side (180 degree) and then insert the CF card into the slot

4. Power On your system
Before power on your system, please measure the power signal in advance and double confirm the data with below table.

Pin	Signal
1	+9~36V DC input (V+)
2	Voltage Ground (V-)
3	Cable Shading Ground

Please pay special attention to make sure the plus voltage input is in pin1 (V+), and zero voltage input is in pin2 (V-). Mix these two pins may cause product damage.
Pin 3 is system shading ground.

Press the PWR-ON button and then begin to run your system

3.0 AWARD BIOS SETUP

3.1 Award BIOS Setup

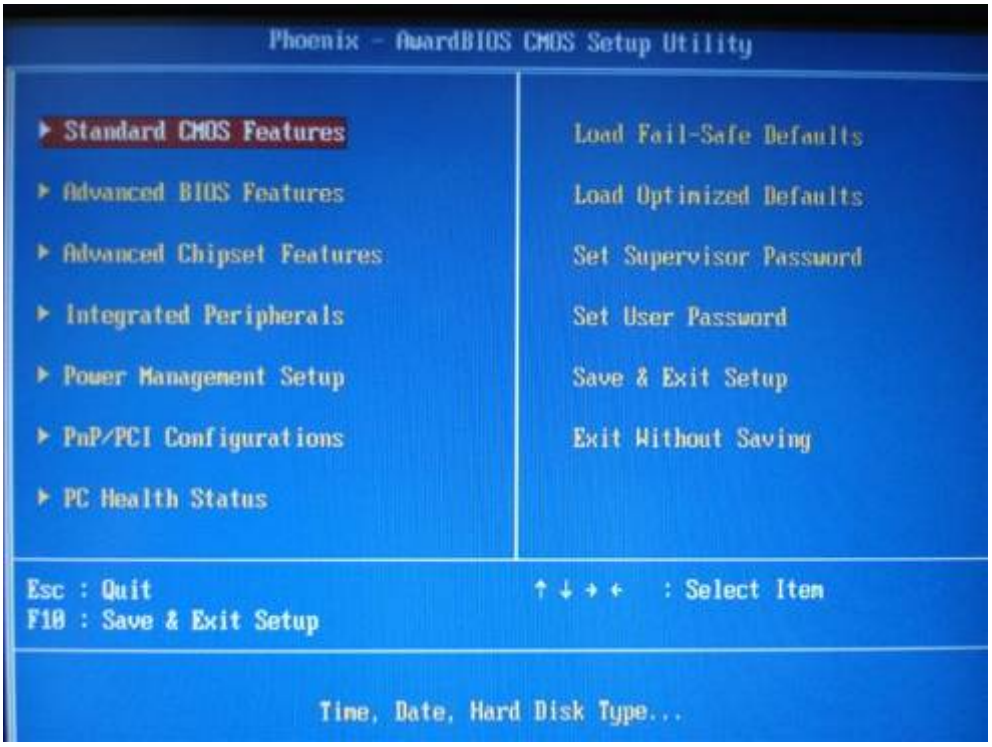
The BIOS setup, also called CMOS setup, is a crucial part of the proper setting up of Ruggcore. The BIOS (Basic Input Output System) tells the operating system the characteristics of the main basic components of Ruggcore. Because of this, an incorrectly set up BIOS can result in some devices not being recognized by the operating system.

Getting into the Award BIOS

Cold boot Ruggcore and when you see the first screen showing in monitor, press the Delete key repeatedly till you get a blue screen titled.
When you successfully get into the BIOS setup, you will be presented with the following menu.

Setup 1: The Main BIOS Menu.

The sections that follow provide guidelines on how to set up the various settings in each section of the BIOS. We have concentrated only on those settings that may need changing, if a setting does not appear in this document, leave it as you found it.
Press Enter on a main menu option to go into that section.
To return to the Main Menu from within a section, press Escape.



Screen 1

Setup 2: Standard CMOS Features

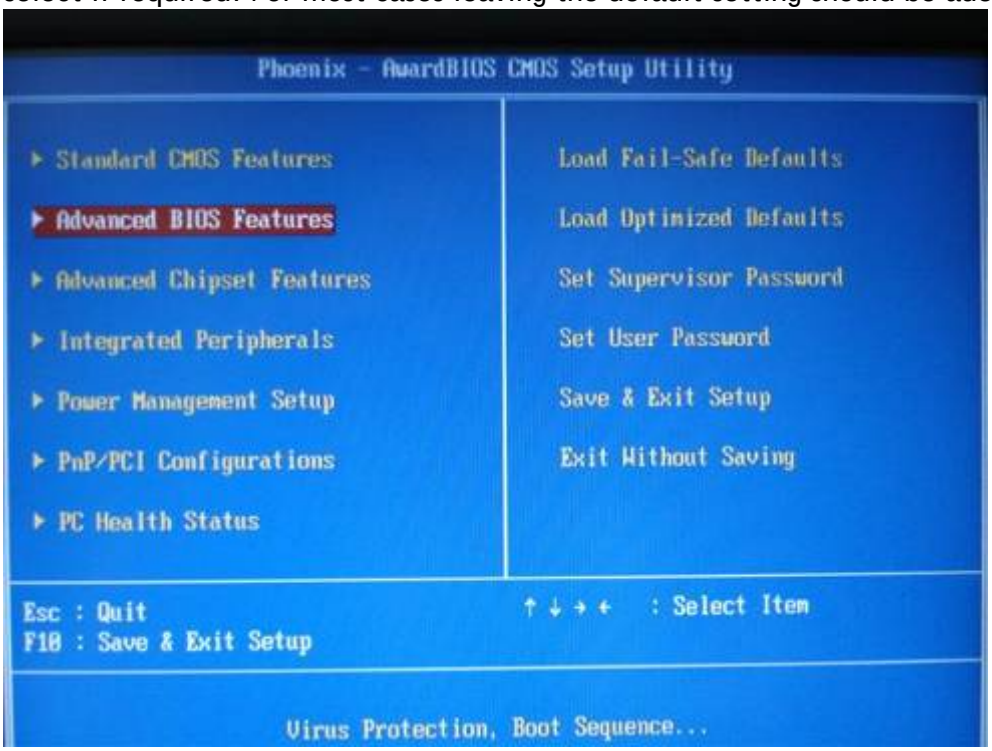
Here you can setup the basic BIOS features such as date and time. Use the arrow keys to move around and press enter to select the required option. You can specify what IDE or SATA devices you have such as Hard drive, CF device etc. The easiest way to setup the devices is by leaving it set to auto. This allows the BIOS to detect the devices automatically so you don't have to do it manually. At the bottom, it also displays the total memory in your system. Verify that your hard disk or CF device have been correctly detected in the shaded fields.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features
Date (mm:dd:yy) Mon, Jan 19 2009
Time (hh:mm:ss) 18 : 10 : 48
IDE Channel 0 Master [TRANSCEND]
IDE Channel 0 Slave [None]
SATA Port1 Device [None]
SATA Port2 Device [None]
Video [EGA/VGA]
Halt On [All , But Keyboard]
Base Memory 639K
Extended Memory 1838336K
Total Memory 1839360K
Item Help
Menu Level ▸
Change the day, month, year and century

Screen 2

Setup 3: Advanced BIOS Features

As you can see from screen 3, there are numerous advance settings which you can select if required. For most cases leaving the default setting should be adequate.



Screen 3

As you can see from the screen 4, the first and second boot device is set to Hard Disk. This ensures that the hard disk is read first when the system boots, and therefore can boot from boot disk. The third is set to CD ROM.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features
Hard Disk Boot Priority [Press Enter]
CPU L3 Cache [Enabled]
Quick Power On Self Test [Enabled]
First Boot Device [Hard Disk]
Second Boot Device [USB-CDROM]
Third Boot Device [CDROM]
Boot Other Device [Enabled]
Boot Up NumLock Status [On]
Gate A20 Option [Fast]
Typematic Rate Setting [Disabled]
x Typematic Rate (Chars/Sec) 6
x Typematic Delay (Msec) 250
Security Option [Setup]
APIC Mode Enabled
MPS Version Control For OS [1.4]
OS Select For DRAM > 64MB [Non-OS2]
Full Screen LOGO Show [Enabled]
Small Logo(EPA) Show [Enabled]
Item Help
Menu Level ▸
Select Hard Disk Boot Device Priority
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help

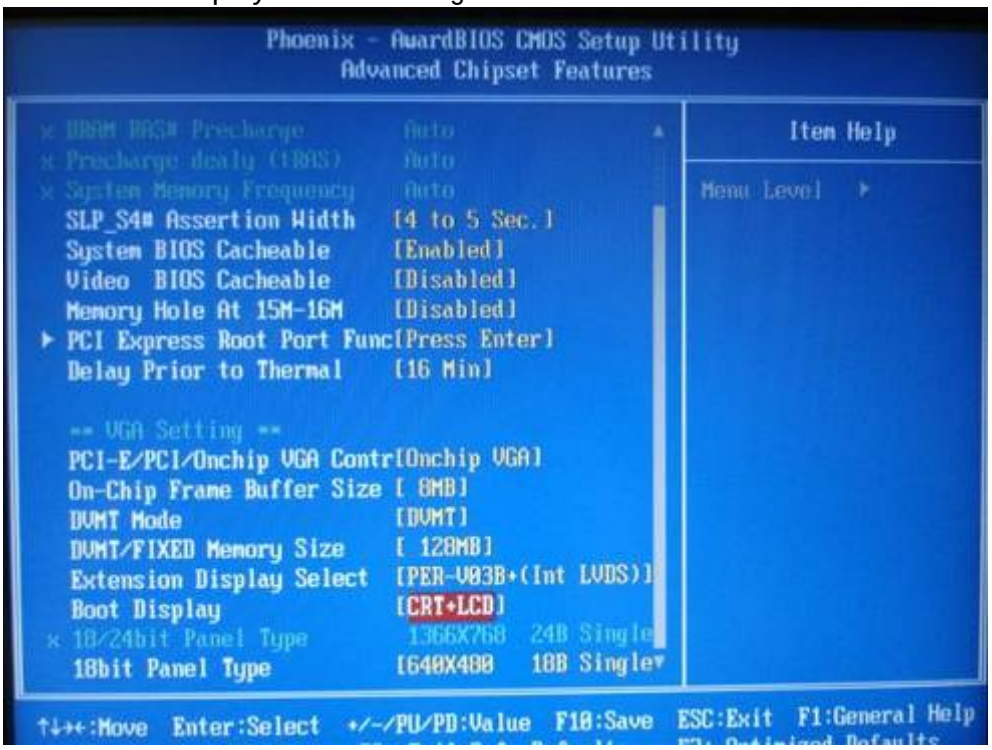
Screen 4

Setup 4: Advanced Chipset Features

Here you can setup the contents of the chipset buffers. It is closely related to the hardware and is therefore recommended that you leave the default setting unless you know what you are doing. Having an incorrect setting can make your system unstable.

Screen 5

Choose Boot Display in VGA Setting Selection Items


Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features
Item Help
Menu Level ▸
SLP_S4# Assertion Width [4 to 5 Sec.]
System BIOS Cacheable [Enabled]
Video BIOS Cacheable [Disabled]
Memory Hole At 15M-16M [Disabled]
PCI Express Root Port Func [Press Enter]
Delay Prior to Thermal [16 Min]
** VGA Setting **
PCI-E/PCI/Onchip VGA Contr [Onchip VGA]
On-Chip Frame Buffer Size [8MB]
DVMT Mode [DVMT]
DVMT/FIXED Memory Size [128MB]
Extension Display Select [PER-V03B+(Int LVDS)]
Boot Display [CRT+LCD]
18bit Panel Type [640X480 18B Single]
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help

Screen 6

Select [CRT+LCD] item for LVDS output option:

Screen 7

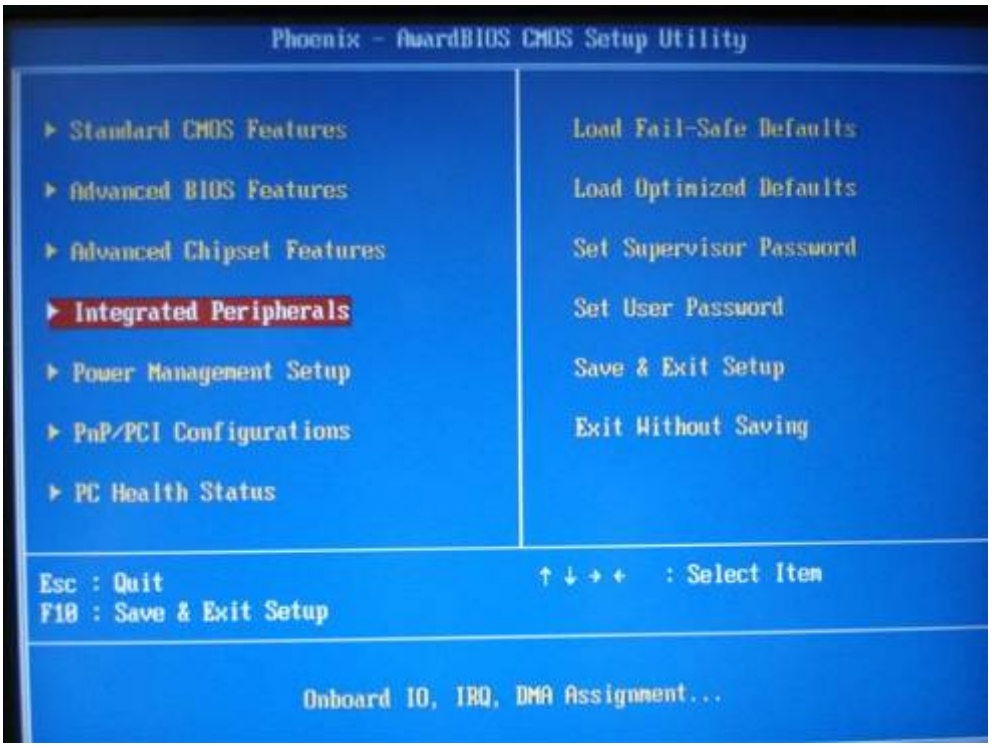
Select [CRT+DVI or HDMI] item for DVI or HDMI output option:

Assertion Width 14 to 5 Sec.
Boot Display
CRT ..... [ ]
LCD ..... [ ]
CRT+LCD ..... [ ]
DVI OR HDMI ..... [ ]
CRT+DVI OR HDMI ..... [■]
↑↓:Move ENTER:Accept ESC:Abort
640X480 18B Single

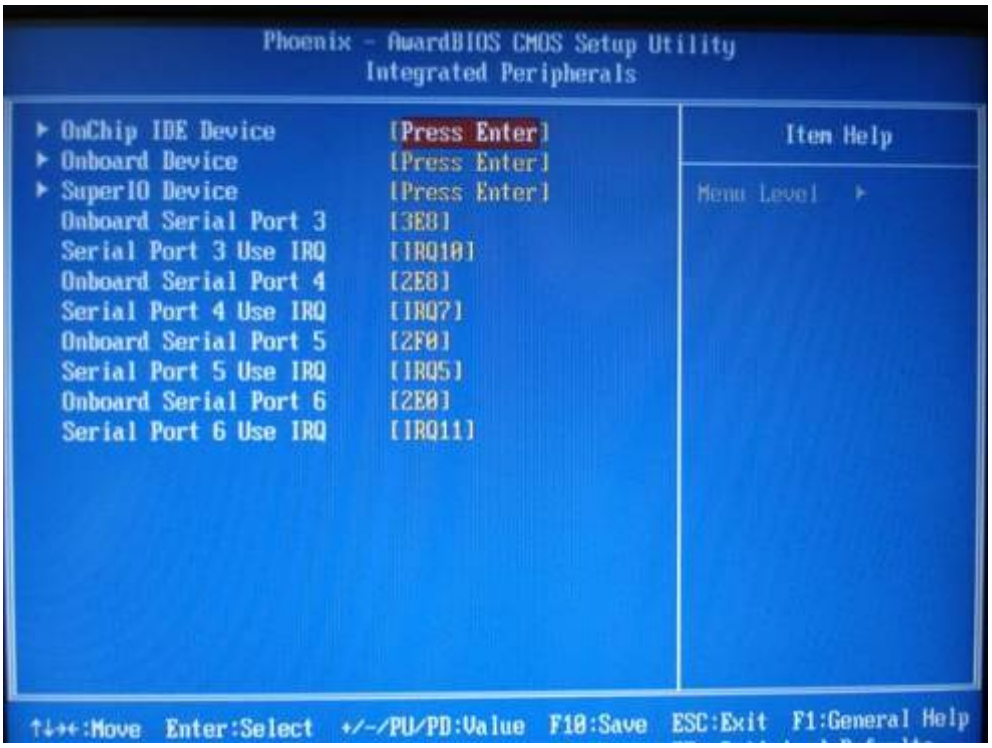
Screen 8

Setup 5: Integrated Peripherals

This menu allows you to change the various I/O devices such as IDE controllers, serial ports, keyboard, USB, and LAN. You can make changes as necessary.



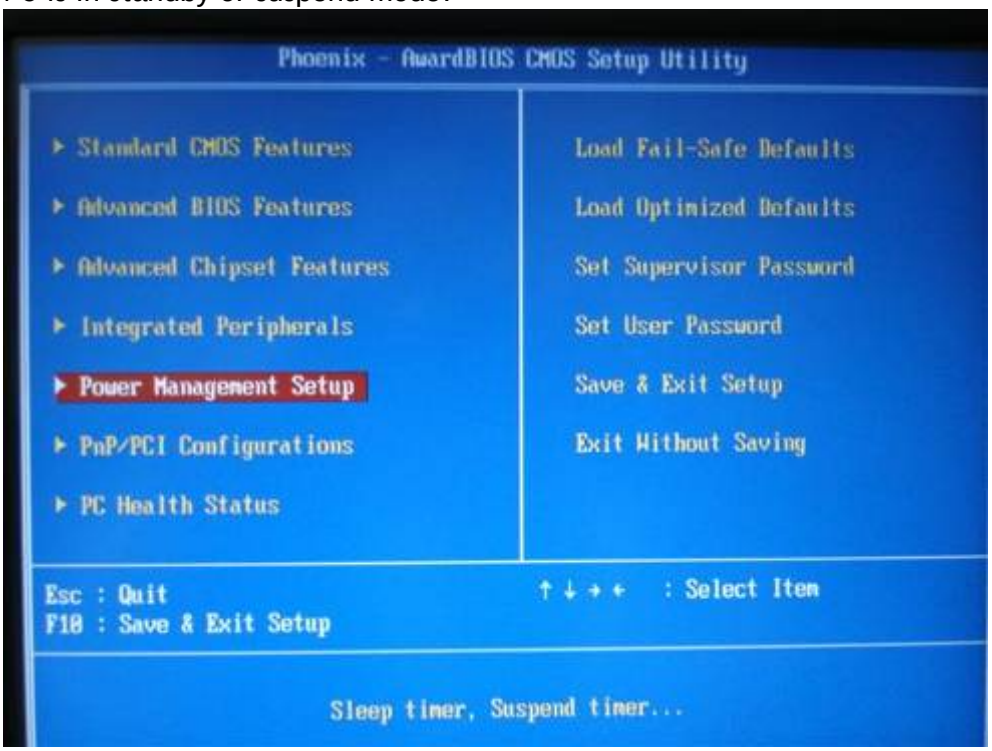
Screen 9


Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals
OnChip IDE Device [Press Enter]
Onboard Device [Press Enter]
SuperIO Device [Press Enter]
Onboard Serial Port 3 [3E8]
Serial Port 3 Use IRQ [IRQ10]
Onboard Serial Port 4 [2E8]
Serial Port 4 Use IRQ [IRQ7]
Onboard Serial Port 5 [2F8]
Serial Port 5 Use IRQ [IRQ5]
Onboard Serial Port 6 [2E8]
Serial Port 6 Use IRQ [IRQ11]
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help

Screen 10

Setup 6: Power Management Setup

The power management allows you to setup various power saving features, when the PC is in standby or suspend mode.



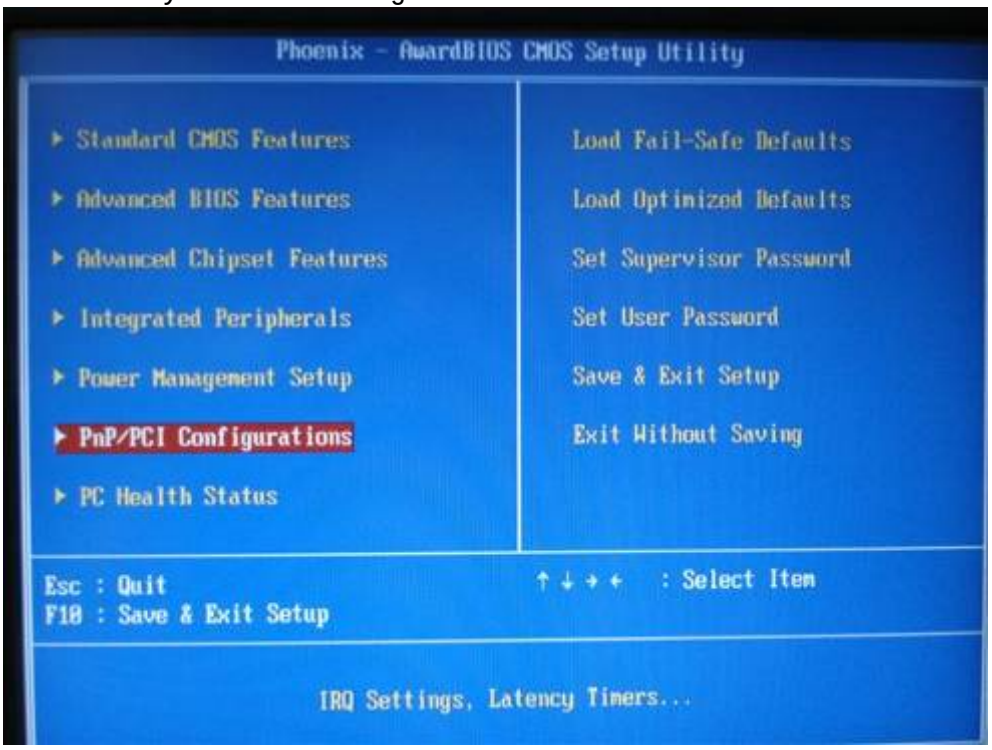
Screen 11

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup
PCI Express PM Function [Press Enter]
Power-Supply Type [ATX]
ACPI Function [Enabled]
ACPI Suspend Type [S3(STR)]
Run VGABIOS if S3 Resume [Auto]
Power Management [User Define]
Video Off Method [DPMS]
Video Off In Suspend [Yes]
MODEM Use IRQ [3]
Suspend Mode [Disabled]
HDD Power Down [Disabled]
Soft-Off by PWR-BTTN [Delay 4 Sec.]
Wake-Up by PCI card [Enabled]
Power On by Ring [Enabled]
Resume by Alarm [Disabled]
x Date(of Month) Alarm 0
x Time(hh:mm:ss) Alarm 0 : 0 : 0
Item Help
Menu Level ▸
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help

Screen 12

Setup 7: PnP/PCI Configurations

This menu allows you to configure your PCI slots. You can assign IRQ's for various PCI slots. It is recommended that you leave the default settings, BIOS can automatically configure all the boot and plug & play compatible devices. You may choose manual mode when you want to change PCI device resources.



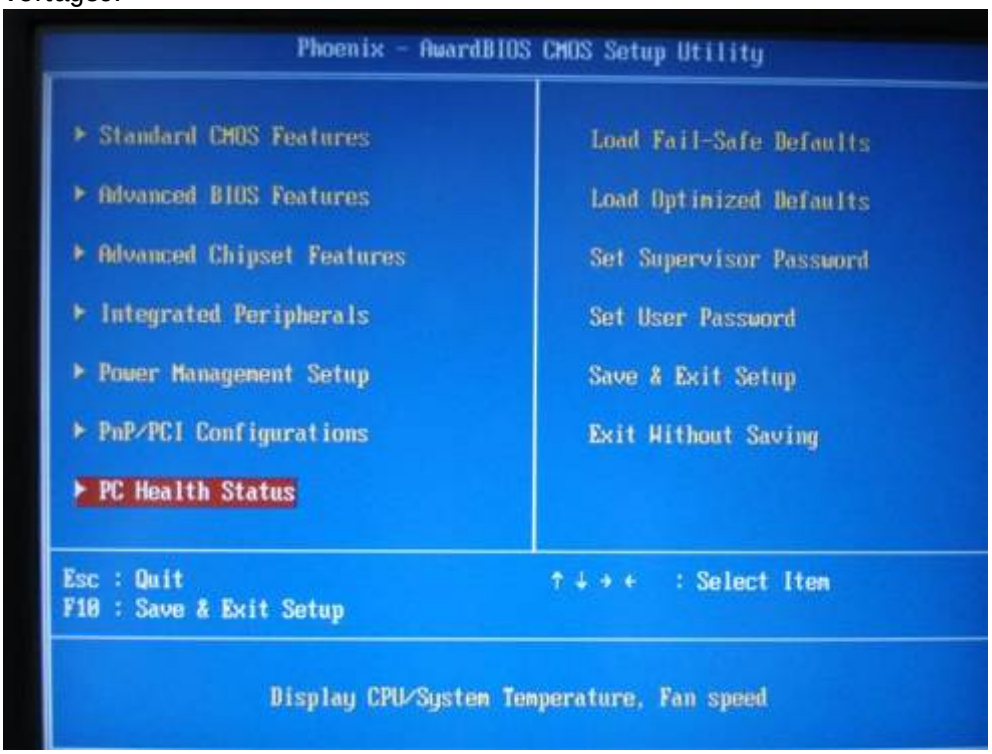
Screen 13

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations
Init Display First [Onboard]
Reset Configuration Data [Disabled]
Resources Controlled By [Auto(ESCD)]
x IRQ Resources Press Enter
PCI/VGA Palette Snoop [Disabled]
** PCI Express relative items **
Maximum Payload Size [128]
Item Help
Menu Level ▶
↑↓→←:Move Enter:Select +/-/PU/PD:Value F10:Save ESC:Exit F1:General Help

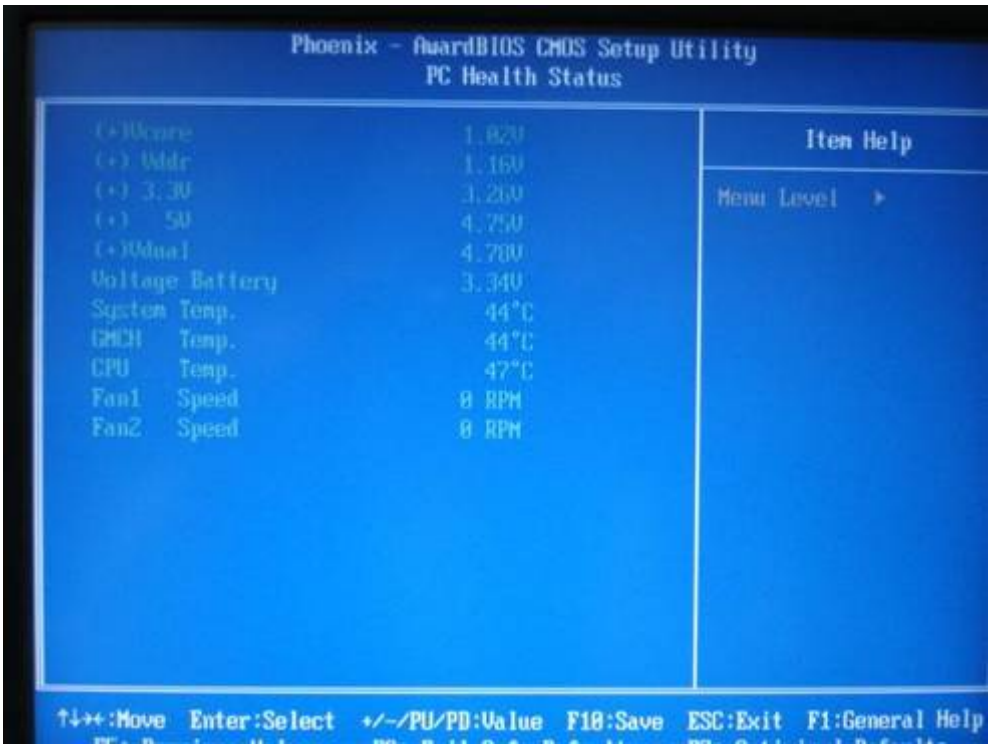
Screen 14

Setup 8: PC Health Status

This menu displays the current CPU, chipset, system temperature, fan speeds, and voltages.



Screen 15



Screen 16

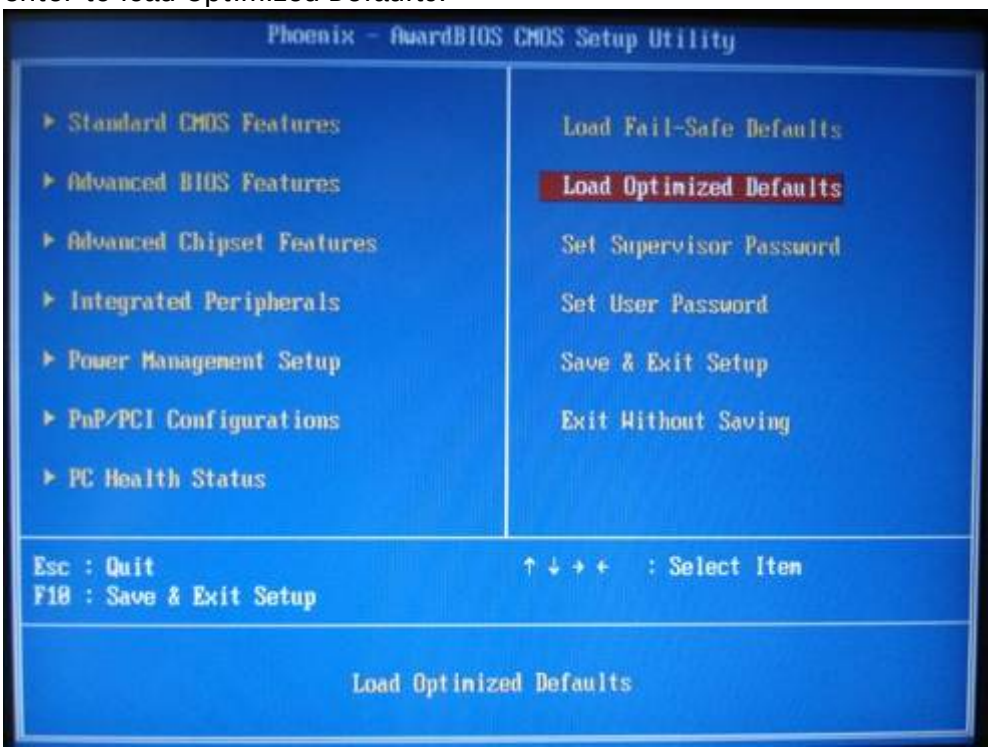
Setup 9: Load Fail-Safe Defaults

If you made changes to the BIOS and your system becomes unstable as a result, you can change it back to default. However if you made many changes and don't know which one is causing the problem, your best bet is to choose the option "Load Fail Safe Defaults" from the BIOS menu. This uses a minimal performance setting, but the system would run in a stable way. From the dialog box Choose "Y" followed by enter to load Fail-Safe Defaults.

Screen 17

Setup 10: Load Optimized Defaults

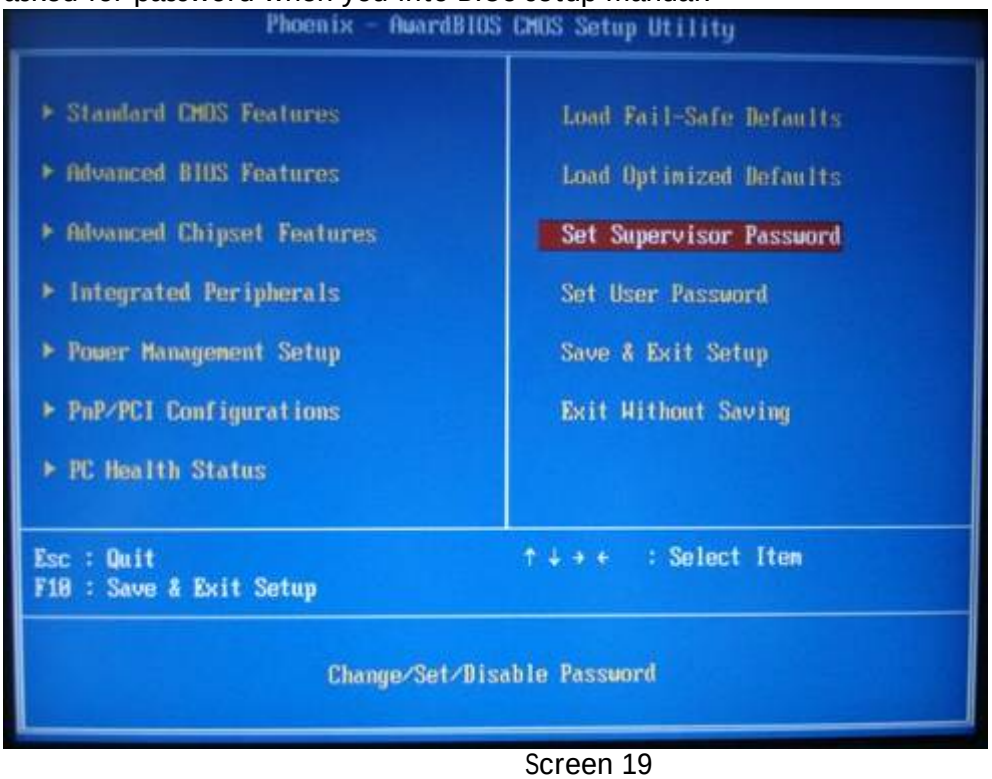
Like the Fail-Safe mode above, this option loads the BIOS default settings, but runs the system at optimal performance. From the dialog box Choose "Y" followed by enter to load Optimized Defaults.



Screen 18

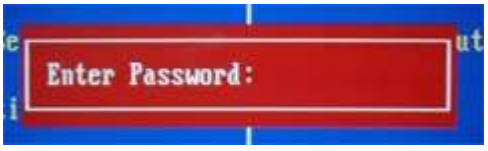
Steup11: Set Password

There are two kinds of password protect your BIOS, Supervisor and User password, you can specify a password and make sure you don't forget the password. You will be asked for password when you into BIOS setup manual.



Screen 19

Screen 20



Setup 12: Save and Exit Setup

To save any changes you made to the BIOS you must choose this option. From the dialog box choose "Y".

Screen 21

Setup 13: Exit without Saving

If you don't want to save changes made to the BIOS, choose "N" from the dialog box.

Screen 22

4.0 DRIVER INSTALLATION

The REC5425 comes with a CD-ROM that contains all drivers and utilities that meet your needs.

Follow the sequence below to install the drivers:
Step 1 – Install INF Driver
Step 2 – Install VGA Driver
Step 3 – Install LAN Driver
Step 4 – Install Audio Driver

USB 2.0 Drivers are available for download using Windows Update for both Windows XP and Windows 2000. For additional information regarding USB 2.0 support in Windows XP and Windows 2000, please visit www.microsoft.com/hwdev/usb/.

Please read instructions below for further detailed installations.

4.1 Installation:

Insert the REC5425 CD-ROM into the CD-ROM Drive. And install the drivers from Step 1 to Step 6 in order.

Step 1 – Install INF Driver

1. Click on the *Step 1 - INF* folder and then double click on the *Setup.exe*
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 2 – Install VGA Driver

1. Click on the *Step 2 - VGA* folder and select the folder of OS your system is
2. Double click on the *.exe* file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

Step 3 – Install LAN Driver

1. Click on the *Step 3 - LAN* folder and double click on the *PRO2KXP.exe*
2. Follow the instructions that the window shows
3. The system will help you install the driver automatically

Step 4 – Install Audio Driver

1. Click on the *Step 4 - AC97* folder and select the folder of OS your system is
2. Double click on the *.exe* file
3. Follow the instructions that the window shows
4. The system will help you install the driver automatically

5.0 APPENDIX

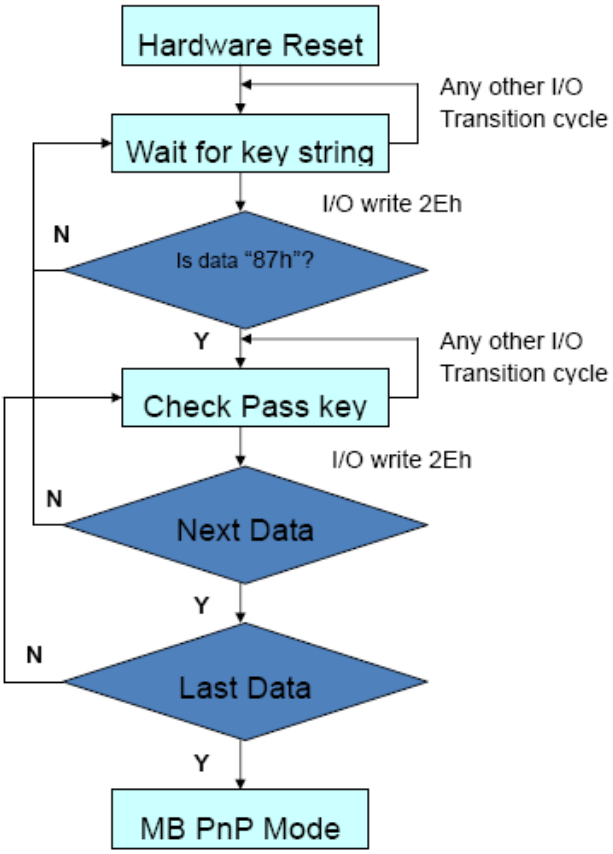
5.1 Programming the watchdog timer

A.1 Programming

REC5425 utilizes ITE 8712 chipset as its watchdog timer controller.
Below are the procedures to complete its configuration and the REC5425 intial watchdog timer program is also attached based on which you can develop customized program to fit your application.

Configuring Sequence Description

After the hardware reset or power-on reset, the ITE 8712 enters the normal mode with all logical devices disabled except KBC. The initial state (enable bit) of this logical device (KBC) is determined by the state of pin 121 (DTR1#) at the falling edge of the system reset during power-on reset.



There are three steps to complete the configuration setup: (1) Enter the MB PnP Mode; (2) Modify the data of configuration registers; (3) Exit the MB PnP Mode. Undesired result may occur if the MB PnP Mode is not exited normally.

(1) Enter the MB PnP Mode

To enter the MB PnP Mode, four special I/O write operations are to be performed during Wait for Key state. To ensure the initial state of the key-check logic, it is necessary to perform four write operations to the Special Address port (2EH). Two different enter keys are provided to select configuration ports (2Eh/2Fh) of the next step.

	Address Port	Data Port
87h, 01h, 55h, 55h:	2Eh	2Fh

(2) Modify the Data of the Registers

All configuration registers can be accessed after entering the MB PnP Mode. Before accessing a selected register, the content of Index 07h must be changed to the LDN to which the register belongs, except some Global registers.

(3) Exit the MB PnP Mode

Set bit 1 of the configure control register (Index=02h) to 1 to exit the MB PnP Mode.

WatchDog Timer Configuration Registers

LDN	Index	R/W	Reset	Configuration Register or Action
All	02H	W	N/A	Configure Control
07H	71H	R/W	00H	WatchDog Timer Control Register
07H	72H	R/W	00H	WatchDog Timer Configuration Register
07H	73H	R/W	00H	WatchDog Timer Time-out Value Register

Configure Control (Index=02h)

This register is write only. Its values are not sticky; that is to say, a hardware reset will automatically clear the bits, and does not require the software to clear them.

Bit	Description
7-2	Reserved
1	Returns to the Wait for Key state. This bit is used when the configuration sequence is completed
0	Resets all logical devices and restores configuration registers to their power-on states.

WatchDog Timer Control Register (Index=71h, Default=00h)

Bit	Description
7	WDT is reset upon a CIR interrupt
6	WDT is reset upon a KBC (mouse) interrupt
5	WDT is reset upon a KBC (keyboard) interrupt
4	WDT is reset upon a read or a write to the Game Port base address
3-2	Reserved
1	Force Time-out. This bit is self-clearing
0	WDT Status
	1: WDT value reaches 0.
	0: WDT value is not 0

WatchDog Timer Configuration Register (Index=72h, Default=00h)

Bit	Description
7	WDT Time-out value select
	1: Second
	0: Minute
6	WDT output through KRST (pulse) enable
5-4	Reserved
3-0	Select the interrupt level[Note] for WDT

WatchDog Timer Time-out Value Register (Index=73h, Default=00h)

Bit	Description
7-0	WDT Time-out value 7-0

A.2 IT8712 Watchdog Timer Initial Program

```
        .MODEL SMALL
        .CODE
Main:
        CALL Enter_Configuration_mode
        CALL Check_Chip
        mov cl, 7
        call Set_Logic_Device
        ;time setting
        mov cl, 10 ; 10 Sec
        dec al
Watch_Dog_Setting:
        ;Timer setting
        mov al, cl
        mov cl, 73h
        call Superio_Set_Reg
        ;Clear by keyboard or mouse interrupt
        mov al, 0f0h
        mov cl, 71h
        call Superio_Set_Reg
        ;unit is second.
        mov al, 0C0H
        mov cl, 72h
        call Superio_Set_Reg
       ; game port enable
       mov cl, 9
       call Set_Logic_Device
       Initial_OK:
       CALL Exit_Configuration_mode
       MOV AH,4Ch
       INT 21h
       Enter_Configuration_Mode PROC NEAR
       MOV SI,WORD PTR CS:[Offset Cfg_Port]
       MOV DX,02Eh
       MOV CX,04h
```

```
Init_1:
MOV AL,BYTE PTR CS:[SI]
OUT DX,AL
INC SI
LOOP Init_1
RET
Enter_Configuration_Mode ENDP
Exit_Configuration_Mode PROC NEAR
MOV AX,0202h
CALL Write_Configuration_Data
RET
Exit_Configuration_Mode ENDP
Check_Chip PROC NEAR
MOV AL,20h
CALL Read_Configuration_Data
CMP AL,87h
JNE Not_Initial
MOV AL,21h
CALL Read_Configuration_Data
CMP AL,12h
JNE Not_Initial
Need_Initial:
STC
RET
Not_Initial:
CLC
RET
Check_Chip ENDP
Read_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
     OUT DX,AL
MOV DX,WORD PTR CS:[Cfg_Port+06h]
IN AL,DX
RET
Read_Configuration_Data ENDP
Write_Configuration_Data PROC NEAR
MOV DX,WORD PTR CS:[Cfg_Port+04h]
OUT DX,AL
XCHG AL,AH
MOV DX,WORD PTR CS:[Cfg_Port+06h]
OUT DX,AL
RET
Write_Configuration_Data ENDP
Superio_Set_Reg proc near
push ax
MOV DX,WORD PTR CS:[Cfg_Port+04h]
mov al,cl
out dx,al
pop ax
inc dx
out dx,al
ret
Superio_Set_Reg endp.Set_Logic_Device proc near
  Set_Logic_Device proc near
```

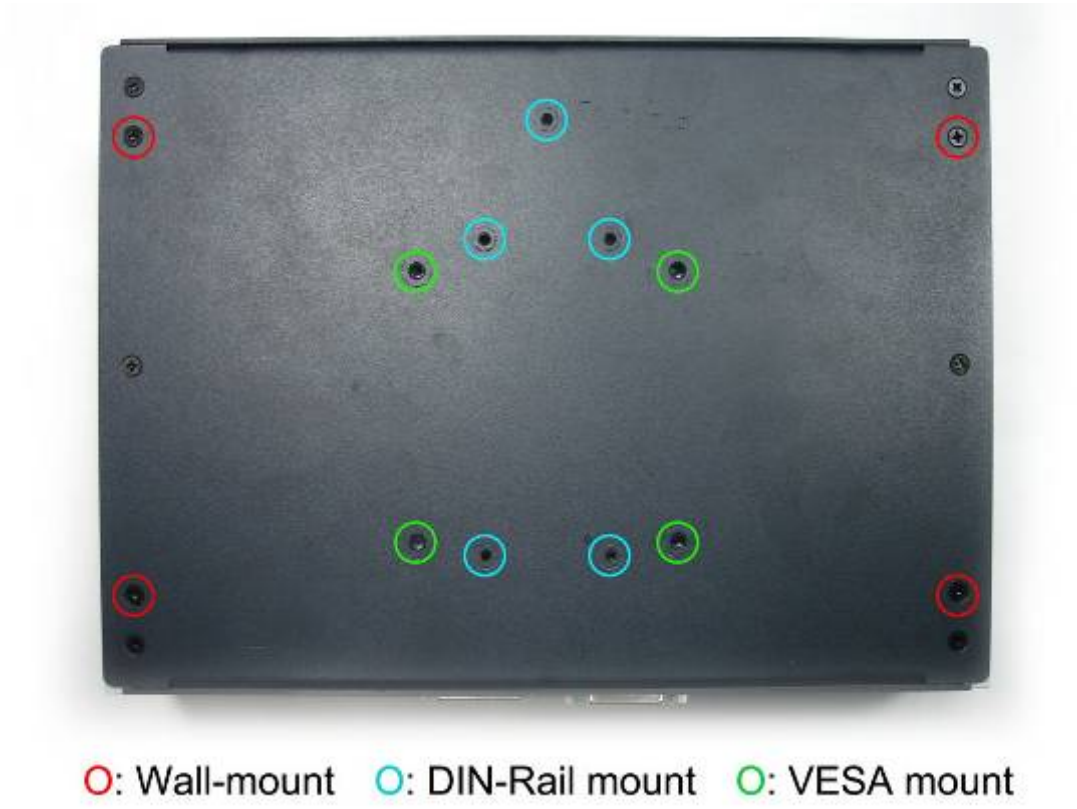
```
    push ax
    push cx
    xchg al,cl
    mov cl,07h
    call Superio_Set_Reg
    pop cx
    pop ax
    ret
    Set_Logic_Device endp
    ;Select 02Eh->Index Port, 02Fh->Data Port
    Cfg_Port DB 087h,001h,055h,055h
    DW 02Eh,02Fh
END Main
```

Note: Interrupt level mapping

0Fh-Dh: not valid
0Ch: IRQ12
.
.
03h: IRQ3
02h: not valid
01h: IRQ1
00h: no interrupt selected

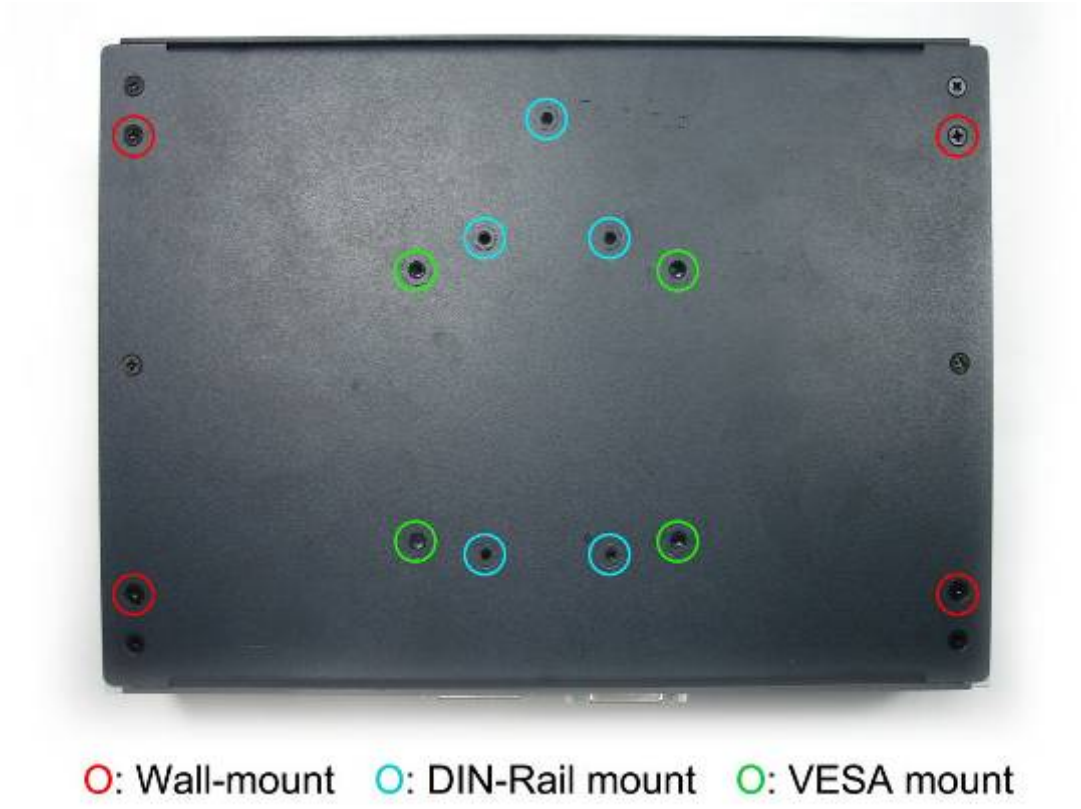
5.2 Wall-Mount Bracket Installation

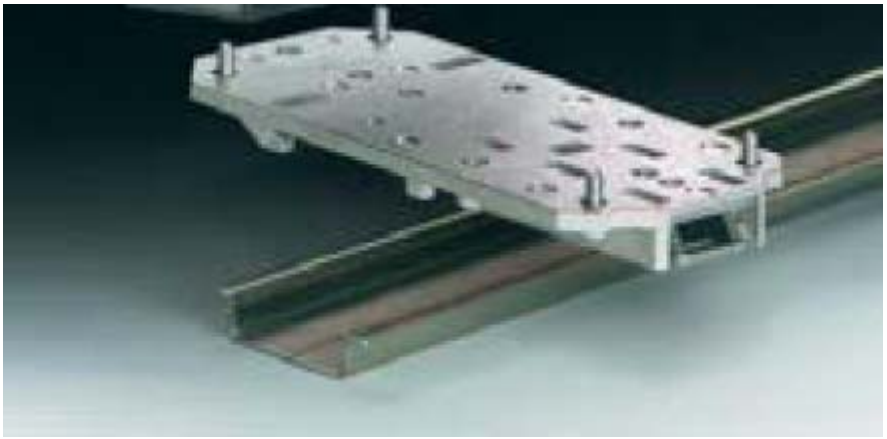
Step 1 – Unscrew the 4 screws as below in red circle



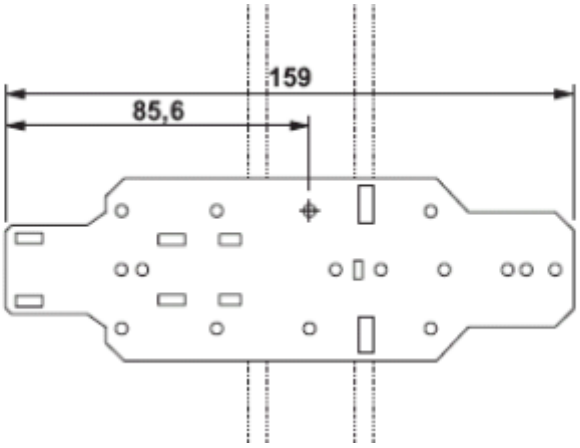
Step 2 – Screw the bracket with 4 screws (M3x16) as below

5.3 DIN-Rail Mounting





UTA 159



The accessory part needs installing with 3mm screws. To ensure installation completed, screwing the parts and the product tightly is important. Levels of load-bearing capacity vary with different type of products.
If you are interested in that, please contact your local staff of PhoneixContact for more details.

a) First of all, to ensure the screw will be well-accommodated to the product and accessory screw holes, please check the position. Fig.1

(Note: The Spring Release Device of UTA must align the edge with the product to prevent from further difficulty removing!)

b) Tightly screw all the accessory and product screws to the holes to complete the assembly. Fig.2

c) Installing the product on the DIN rail, please insert the accessory hook into the DIN rail slot. Fig.3

d) And push the product to the DIN rail till heard "Ka" that sound means Installation is completion. Fig.4

e) Removing the product from the DIN rail, please put a screwdriver into the hole of Spring Release Device. Fig.5

f) Pull out the hole from the Spring Release Device to complete the removing. Fig.6

Fig.1

Fig.2

Fig.3

Fig.4

Fig.5

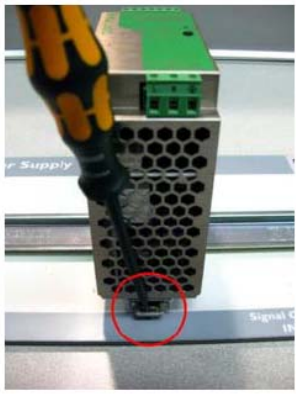
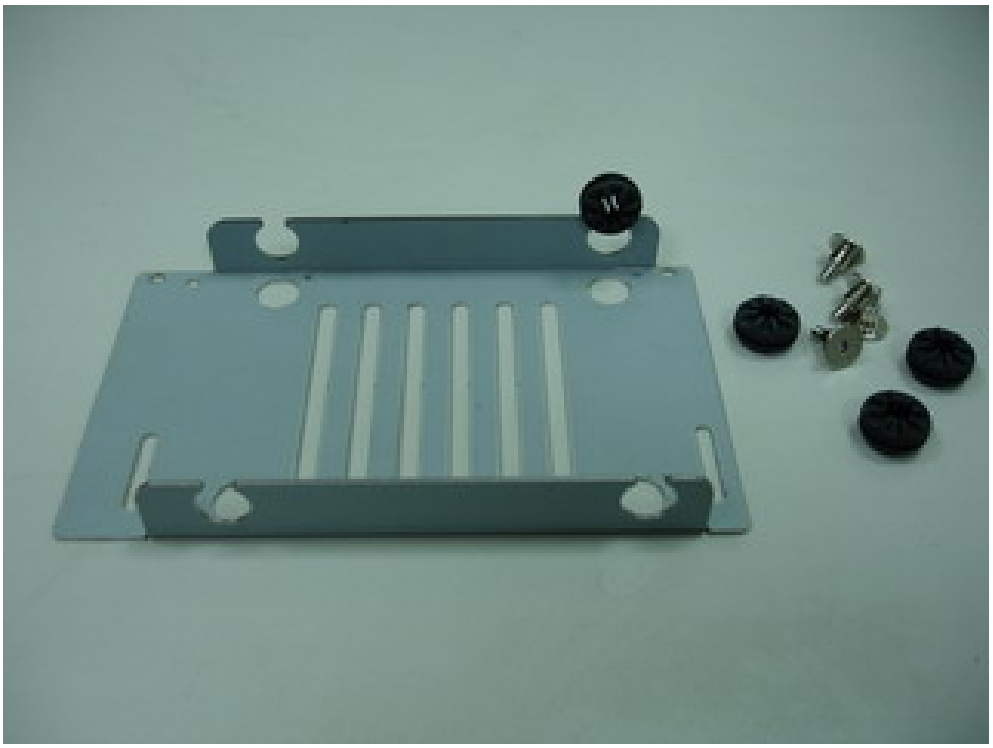


Fig.6

5.4 HDD Bay Installation Procedure

Step 1 – Install the 4 dampers into the bracket as below



Step 2 – Screw the 4 screws into the HDD with bracket as below

Step 3 – Connect the SATA signal and power cable with the HDD as below

Step 4 – Screw the 4 screws into the HDD bracket as below in red circle and connect the SATA cable with SATA connectors in carrier board.